

### **REMARKS**

Claims 1-3, 6, 8-15 and 18-22 are pending in this application, claims 7, 16, 17 and 23-29 being withdrawn. By this Amendment, claims 1, 6-9, 12 and 23-25 are amended and claim 5 is canceled without prejudice to or disclaimer of the subject matter recited therein. Claims 6-9 and 12 are amended for dependency. Withdrawn claims 23-25 are amended in accordance with the amendments of claim 1. Support for the amendments to claim 1 can be found, for example, at least in original claim 5 and in Figs. 6-7. No new matter is added. Applicants respectfully request reconsideration of the application based on the foregoing amendments and the following remarks.

#### **Rejections under 35 U.S.C. §112**

Claim 1 stands rejected by the Examiner under 35 U.S.C. §112, second paragraph. In accordance with this rejection, the claims have been amended to comply with the examiner's suggestions and are now believed to conform with Section 112. Applicants respectfully request that the rejection of claim 1 under 35 U.S.C. §112, second paragraph be withdrawn.

Claim 1 stands rejected by the Examiner under 35 U.S.C. §112, sixth paragraph. The Office Action asserts that Applicants' specification does not "disclose the corresponding structure, material, or acts for the claimed invention" (see Office Action, page 3). Applicants respectfully disagree with this assertion for at least the following reasons.

Applicants original claims supply the corresponding structure for each of "a gas supply means for supplying a plurality of gases," "a gas distribution means for distributing and spraying the gases," "a gas retaining means for partitionally accommodating and concurrently retaining the gases," "a rotation driving means for rotating selectively one of the gas retaining means and the susceptor," and "a gas exhaust means for pumping the gases," as recited in independent claim 1. For example, at least original claims 5, 12 14 and 19 recite specific structure for the respective claimed means. Moreover, at least Figs. 4 and 5 and paragraphs [44] – [49] of the specification discuss "a gas supply means." At least Fig.

5 and paragraphs [50] – [56] of the specification discuss “a gas distribution means.” At least Fig. 7 and paragraphs [57] – [72] of the specification discuss “a gas retaining means.” At least Figs. 5 and 9 and the rotation shafts 220 and 320 of the specification disclose “a rotation driving means.” At least Figs. 5, 6 and 9 and paragraphs [73] – [76] of the specification discuss “a gas exhaust means.”

In view of the foregoing, the structure of the respective means claimed in Applicants’ claims is amply supported by the specification and accompanying Figures. Applicants respectfully request that the rejection of claim 1 under 35 U.S.C. §112, sixth paragraph be withdrawn.

**Rejections under 35 U.S.C. §103(a)**

To establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based upon the Applicants’ disclosure. A failure to meet any one of these criteria is a failure to establish a *prima facie* case of obviousness. See MPEP §2143.

The Office Action rejects claims 1, 3, 5, 6, 8, 11-13, 15 and 21 under 35 U.S.C. §103(a) as being unpatentable over KR unexamined Publication No. 10-2003-0086056 to Shim et al. (hereinafter “Shim”), in view of U.S. Patent No. 5,186,756 to Benko (hereinafter “Benko”), U.S. Publication No. 2004/0082171 to Shin, et al. (hereinafter “Shin”) and U.S. Patent No. 6,656,284 to Hwang (hereinafter “Hwang”). Applicants respectfully traverse the rejection of claims 1, 3, 6, 8, 11-13, 15 and 21, the rejection of canceled claim 5 being moot, and request reconsideration of the claims.

The applied references, in any combination, do not teach and would not have rendered obvious “a gas retaining means for partitionally accommodating and concurrently retaining the gases distributed from the gas distribution means, the gas retaining means comprising: an upper plate having a bottom face; and a plurality of partition walls protruding from the bottom face and installed at regular intervals below the bottom face, such that the partition walls define therebetween a plurality of reaction cells below the upper plate, wherein the partition walls are configured so as to increasingly broaden the width of the reaction cells from the inside to the outside of the gas retaining means and to partitionally accommodate and concurrently retain the respective gases distributed from the gas distribution means,” as recited in amended independent claim 1.

The Office Action admits that Shim fails to disclose “wherein the partition walls are configured so as to increasingly broaden the width of the reaction cells from the inside to the outside of the gas retaining means,” as recited in amended independent claim 1, but asserts that Benko, in Figs. 2-3, remedies this deficiency of Shim (see Office Action, pages 5-6). Specifically, the Office Action asserts that Benko discloses slots 22 whose configuration allegedly corresponds to the configuration of the claimed reaction cells (see Office Action, pages 5-6). Applicants respectfully traverse these assertions for at least the following reasons.

Benko merely discloses that triangular-shaped slots 22 are positioned in an injection plate 16 that is a lower end of a gas guiding member 14, the gas guiding member 14 being within an enclosure 10 (see Benko, Fig. 1). Thus, input gases 20 are introduced onto a substrate 17 within the enclosure 10 via the injection plate 16 having the slots 22 (see Benko, Fig. 1). The slots 22 are generally triangular in shape with the narrow portion of the triangle facing the center of the injection plate 16 (see Benko, Figs. 2 and 3). Benko teaches that this particular orientation of the triangular-shaped slots 22 in the injection plate 16, from which the input gases 20 exit, helps alleviate the tendency of vertically-oriented flows of input gases 20 from depositing thicker layers in the central portions of the substrate 17 (see

Benko, col. 4, lines 7-11). Benko is therefore merely concerned with the shape of the slots 22 from which the input gases 20 exit. Indeed, Benko makes no particular mention of the specific shape of the enclosure 10 in which the reaction of the input gases 20 on the substrate 17 takes place. As a result, Benko does not disclose and would not have rendered obvious the claimed configuration of Applicants' reaction cells.

Moreover, those of ordinary skill in the art would not have had any motivation to combine Benko's slots 22 with Shim's injectors 131-134 in an attempt to obtain Applicants' claimed retention cells. Specifically, Shim's injectors 131-134 are already oriented over the entire radial width of Shim's substrate (see Shim, Figs. 3, 5 and 6). Consequently, those of ordinary skill in the art would not look to Benko at all to incorporate Benko's triangular slots 22 to prevent uneven distribution of the gases on the substrate. Shim's injectors 131-134 are already configured to evenly distribute gases over the entire radial width of the substrate. Indeed, as noted by the Office Action, "Shim discloses in Para 64, the injection grooves 131a-133c formed on each injector 131-134 provides the space in which the gas coming in spreads"...which "reduces the fast speed of the inflow gas" (see Office Action, page 5). By spreading the incoming gas over the length of the injector 131-134 and reducing the speed of the inflow gas, Shim's gas is distributed evenly over the face of Shim's substrate from the center of the substrate to the outer perimeter of the substrate. Thus, Shim's injectors 131-134 have no need of Benko's slots 22 and, as a result, those of ordinary skill in the art would not have been motivated to look to Benko at all. The other applied references, in any combination, fail to remedy this deficiency.

The Office Action also asserts that Shim discloses "an upper panel 110 and a plurality of reaction cells 132-134 partitioned in there" that allegedly corresponds to the claimed upper plate and claimed reaction cells, respectively (see Office Action, page 8). The Office Action further asserts that Shim's upper panel 110 inherently comprises an upper plate (see Office Action, page 8). Applicants respectfully traverse these assertions for at least the following reasons.

Shim merely discloses injectors 131-134 that can be placed in a top surface of an upper panel 110 and may be alternately installed on the top surface of the upper panel 110 (see Figs. 3 and 5). The placement of the injectors 131-134 on the top side of the upper panel 110 precludes the injectors 131-134 from physically partitioning any area below the upper panel 110. Indeed, Shim's injectors 131-134 do not partition any space over the substrate below the upper panel 110, but instead cooperate with one another to merely distribute gases evenly over the substrate. Consequently, Shim does not disclose and would not have rendered obvious the "gas retaining means comprising: an upper plate having a bottom face; and a plurality of partition walls protruding from the bottom face and installed at regular intervals below the bottom face, such that the partition walls define therebetween a plurality of reaction cells below the upper plate," as recited in amended independent claim 1. The other applied references, in any combination, fail to remedy this deficiency.

In view of the foregoing, the applied references, either alone or in combination, do not teach and would not have rendered obvious the features of amended independent claim 1. Claim 1 is thus patentable over the applied references, in any combination. Consequently, Applicants respectfully request the withdrawal of the rejection of amended independent claim 1. In addition, claims 3, 6, 8, 11-13, 15 and 21 depend from claim 1. Accordingly, Applicants respectfully request withdrawal of the rejection of these claims, at least based on their respective dependence on an allowable base claim, as well as for the individual features these claims recite.

The Office Action also rejects claim 2 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang, and further in view of U.S. Patent Publication No. 2003/0041971 to Kido (hereinafter "Kido"); rejects claim 9 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang, and further in view of U.S. Patent No. 6,132,512 to Horie et al. (hereinafter "Horie"); rejects claim 10

under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang and Horie, and further in view of U.S. Patent No. 6,929,830 to Tei et al. (hereinafter “Tei”); rejects claim 10 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang and Horie, and further in view of U.S. Patent Publication No. 2006/0000412 to Ahn et al. (hereinafter “Ahn”); rejects claim 14 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang, and further in view of U.S. Patent Publication No. 2005/0017100 to Watanabe et al. (hereinafter “Watanabe”); rejects claim 18 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang and Horie, and further in view of U.S. Patent No. 5,884,009 to Okase (hereinafter “Okase”); rejects claim 18 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang, and further in view of Ahn; rejects claim 19 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang and Okase, and further in view of U.S. Patent No. 5,281,274 to Yoder (hereinafter “Yoder”); rejects claim 19 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang and Okase, and further in view of U.S. Patent No. 6,821,563 to Yudovsky (hereinafter “Yudovsky”); rejects claim 19 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang and Ahn, and further in view of Yoder; rejects claim 19 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang and Ahn, and further in view of U.S. Patent No. 6,821,563 to Yudovsky (hereinafter “Yudovsky”); rejects claim 20 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang and Ahn and Yoder, and further in view of U.S. Patent No. 6,156,151 to Komino (hereinafter “Komino”) and U.S. Patent Publication No. 2005/0167052 to Ishihara et al. (hereinafter “Ishihara”); rejects claim 20 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang and Ahn and Yudovsky and Komino and Ishihara; and rejects claim 22 under 35 U.S.C. §103(a) as being unpatentable over Shim in view of Benko and Shin and Hwang, and further in view of U.S. Patent Publication No. 2005/0224181 to

Merry et al. (hereinafter “Merry”). Applicants respectfully traverse this rejection and request reconsideration of the claims.

As provided above, the applied references, either alone or in combination, do not teach and would not have rendered obvious the features of amended independent claim 1. Claim 1 is thus patentable over the applied references, in any combination. In addition, claims 2, 9, 10, 14, 18-20 and 22 depend from claim 1. Accordingly, Applicants respectfully request withdrawal of the rejections of these claims, at least based on their respective dependence on an allowable base claim, as well as for the individual features these claims recite.

For example, claim 9 recites, in part, “wherein the partition wall is further provided, at both lower end sides thereof, with an extension plate extended in parallel to the susceptor” (emphasis added). These features are not disclosed and would not have been rendered obvious by the applied references in any combination.

The Office Action admits that Shim, Benko, Shin and Hwang do not disclose these features (see Office Action, page 11). However, the Office Action asserts that Horie remedies the deficiencies of these references by disclosing downwardly extending guide plates 12 that allegedly correspond to the claimed extension plate (see Office Action, page 11). This assertion fails for at least the following reasons.

Horie merely discloses a gas ejection head 5, a substrate W, a substrate holder 3, and the downwardly extending guide plates 12 mentioned above, wherein the substrate W is placed below the gas ejection head 5 and on top of the substrate holder 3 (see Horie, Fig. 3). The guide plates extend vertically downward from the gas ejection head 5 and orthogonally to the plane of the substrate holder 3 (see Horie, Figs. 2 and 4). In contrast, Applicants’ claimed extension plate is configured parallel to the susceptor on which Applicants’ substrates are positioned, not to mention the claimed extension plate is positioned on a lower end of Applicants’ claimed partition walls. As a result, Horie does not teach and would not

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have rendered obvious the features recited in claim 9. None of the other applied references, in any combination, remedies these deficiencies.

### **CONCLUSION**

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

If any fees, including extension of time fees or additional claims fees, are due as a result of this response, please charge Deposit Account No. 19-0513. This authorization is intended to act as a constructive petition for an extension of time, should an extension of time be needed as a result of this response. The Examiner is invited to telephone the undersigned if this would in any way advance the prosecution of this case.

Respectfully submitted,

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